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Amended Claims

## CLAIMS

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1. A process of fermentation monitoring in which the reacting chemical species are quantified using a cellular yield curve to create a mass balance between all of the reacting chemical species. A cellular yield curve being a mathematical relationship between substrate utilization and cellular growth. The fermentation monitoring process comprising the steps of:
    - (a) measuring starting chemical species concentrations;
    - (b) dynamically measuring one or all of the concentrations of the reacting chemical species;
    - (c) monitoring and describing the chemical species concentrations via a mass balance calculation as the fermentation proceeds.
  2. A process of fermentation monitoring according to claim 1 applied to a flow-through or fed-batch system.
  3. A process of fermentation control relying on the methodology of claim 1 wherein the timing for control interventions is gauged, and the effects of the intervention are observed.
  4. A process of fermentation monitoring according to claim 1 wherein the fermentation substrates and products are different than those outlined in the specification, but the monitoring and/or control methodology is the same
  5. A process of fermentation monitoring according to claim 1 wherein empirical data is acquired to determine the chemical formula of the species in the reaction.